WHAT IS CLAIMED IS:

1. An optical concentrator for a power generation solar cell comprising:

a Fresnel lens mounted over a solar cell to focus sunlight over the solar cell surface when the concentrator is aligned with the sun; and,

a secondary non-imaging concentrating element mounted intermediate the Fresnel lens and the solar cell to redirect sunlight onto the solar cell surface when the concentrator is misaligned.

2. An optical concentrator as defined in claim 1 wherein the solar cell receives edge rays from the Fresnel lens at a periphery of an active surface of the solar cell with the concentrator aligned with the sun.

3. An optical concentrator as defined in claim 2 wherein the secondary non-imaging concentrating element has predetermined optical characteristics to redirect edge rays within the periphery of the active surface of the solar cell when the concentrator is misaligned by a predetermined angle.

4. An optical concentrator as defined in claim 1 wherein the Fresnel lens is a curved Fresnel lens.

5. An optical concentrator as defined in claim 4 wherein the Fresnel lens is a linear Fresnel lens.

6. An optical concentrator as defined in claim 4 wherein the Fresnel lens is a circular Fresnel lens.

7. An optical concentrator as defined in claim 1 wherein the secondary non-imaging concentrating element is a V-trough.

8. An optical concentrator as defined in claim 7 wherein the V-trough has a contour derived from a straight line fit to a hyperbolic concentrator.

9. An optical concentrator as defined in claim 8 wherein the V-trough has an exit aperture sized to a dimension equal to the periphery of the solar cell active surface.

10. An optical concentrator for a power generation solar cell comprising:

a Fresnel lens mounted over a solar cell to focus sunlight over the solar cell surface, the Fresnel lens having a convergence angle to direct edge rays within a

periphery of an active surface of the solar cell with the concentrator aligned with the sun; and,

a secondary non-imaging concentrating element mounted intermediate the Fresnel lens and the solar cell to redirect sunlight onto the solar cell surface, the secondary non-imaging concentrating element having predetermined optical characteristics to redirect edge rays within the periphery of the active surface of the solar cell when the concentrator is misaligned by a predetermined angle.

11. An optical concentrator for a power generation solar cell as defined in claim 10 wherein the secondary non-imaging concentrating element has an entrance aperture sized to receive edge rays within the convergence angle of the Fresnel lens when the concentrator is misaligned by the predetermined misalignment angle and an exit aperture sized to a dimension equal to the periphery of the solar cell active surface.